IWILL P4R533/P4R533-N Motherboard

User's Manual

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and the receiver.

• Connect the equipment onto an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

Shielded interconnect cables and shielded AC power cable must be employed with this equipment to insure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

• This device may not cause harmful interference, and

This device must accept any interference received, including interference that may cause undesired operation.

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What's In This Chapter:

Introduction
Manual Structure
Manual Features
Critical Topics
Packing List
Pre-Use Checklist

1: Introduction

This is the User's Manual is for the P4R533 motherboard. Please read this chapter before you use your motherboard and identify which parts of the manual you will need to refer to, if any. Please pay particular attention to the Critical Topics section.

Manual Structure

This manual has seven chapters covering the following topics:

Chapter 1: Introduction

Explains the manual structure and conventions and indicates the most important topics in the manual. In addition, there is a list of what you should find in the motherboard package and some pointers on things to do before you configure or install the board.

Chapter 2: Key Features & Components

Details the motherboard's hardware features and important components and indicates their locations. Describes the support software that comes with the board on the Power Installer support CD-ROM disc.

Chapter 3: Motherboard Configuration

Lists the motherboard's default configuration and configuration options.

Chapter 4: Installing The Motherboard

Has information on how to prepare and install the motherboard. Includes installing a CPU and system memory and housing installation considerations.

Chapter 5: System Configuration

Covers connecting system peripherals to the motherboard, initial BIOS configuration using the CMOS Setup utility, OS options and software installation.

Chapter 6: Using The Motherboard

Explains system operation features that derive from the motherboard. Has information on performance optimization and troubleshooting.

Chapter 7: Technical Information

Lists the motherboard's technical specifications.

Manual Features

This User's Manual is intended to be useful and informative while also making it easy to quickly find specific information or specifications. The manual has icons and notes in the sidebar to note important topics, indicate warnings or further explain and illustrate points. We suggest that most users review the manual to become familiar with the motherboard. Expert users may want to review topics selectively, as needed.

If The Motherboard Is Already Installed

You may receive the motherboard installed in a working system. If this is the case, you should still probably review the sections on configuring and using the board, especially if an Operating System is not installed yet.

If You Need To Install This Motherboard

We recommend that only experienced users and technicians install this motherboard. Otherwise, we suggest having a qualified computer technician install and configure the system. This service is usually provided at a nominal fee by better computer stores and service companies.

Critical Topics

Many users do not read through the entire User's Manual. While this may not be necessary for experienced users or if the motherboard is already installed, there are some topics which are particularly important and deserve your specific attention. These topics cover information critical to the proper installation and use of the motherboard.

For this motherboard, please review the sections on the following topics:

- Jumper Configuration
  Please see Chapter 3.
- CPU installation
  Please see Chapter 4.
- System memory installation
  Please see Chapter 4.
- AGP card installation
  Please see Chapter 5.
- Required BIOS configuration
  Please see Chapter 5.
- Support software installation
  Please see Chapter 5.

Packing List

The P4R533 motherboard package includes the following items:

- P4R533 or P4R533-N motherboard
- ATA-66/100 IDE connector cable

  Connects IDE devices to one of the onboard IDE connectors.
- Floppy Disk Drive connector cable

  Connects floppy disk drives to the onboard floppy disk connector.
- Rear I/O Panel Shield

  For use in ATX system housings.
- 2 CRIMM modules

  Conitnuity RIMM modules for unused system memory RIMM sockets.
- 3 Jumper Caps

  Extra caps in case original caps are lost.
- Power Installer support CD-ROM disc

  Includes support software, drivers and bundled software utilities.
- User's Manual
- Quick Installation Guide

Pre-Use Checklist

Before you install and use the motherboard, please do the following:

- Check Package Contents

  Please compare the package contents to the Packing List on the previous page and confirm that all items are present and undamaged.
- Missing or Damaged Accessories

  If anything is missing, please contact your vendor.

- Motherboard Damage

  If the motherboard has been visibly damaged, return the complete package to your vendor with proof of purchase.

- Prepare Minimum System Components

  If you are installing the board in a new system, you'll need at least the following internal components;

  - Intel Pentium 4 processor
  - At least two Rambus RIMM memory module
  - 1.5V AGP video display card
  - Desired storage devices (hard disk, CD-ROM, etc.)

You will also need whatever external system peripherals you intend to use, which will normally include at least a keyboard, a pointing device and a video display monitor.

Chapter Topics:

Hardware Features
- Motherboard Layout
- Key Features & Components

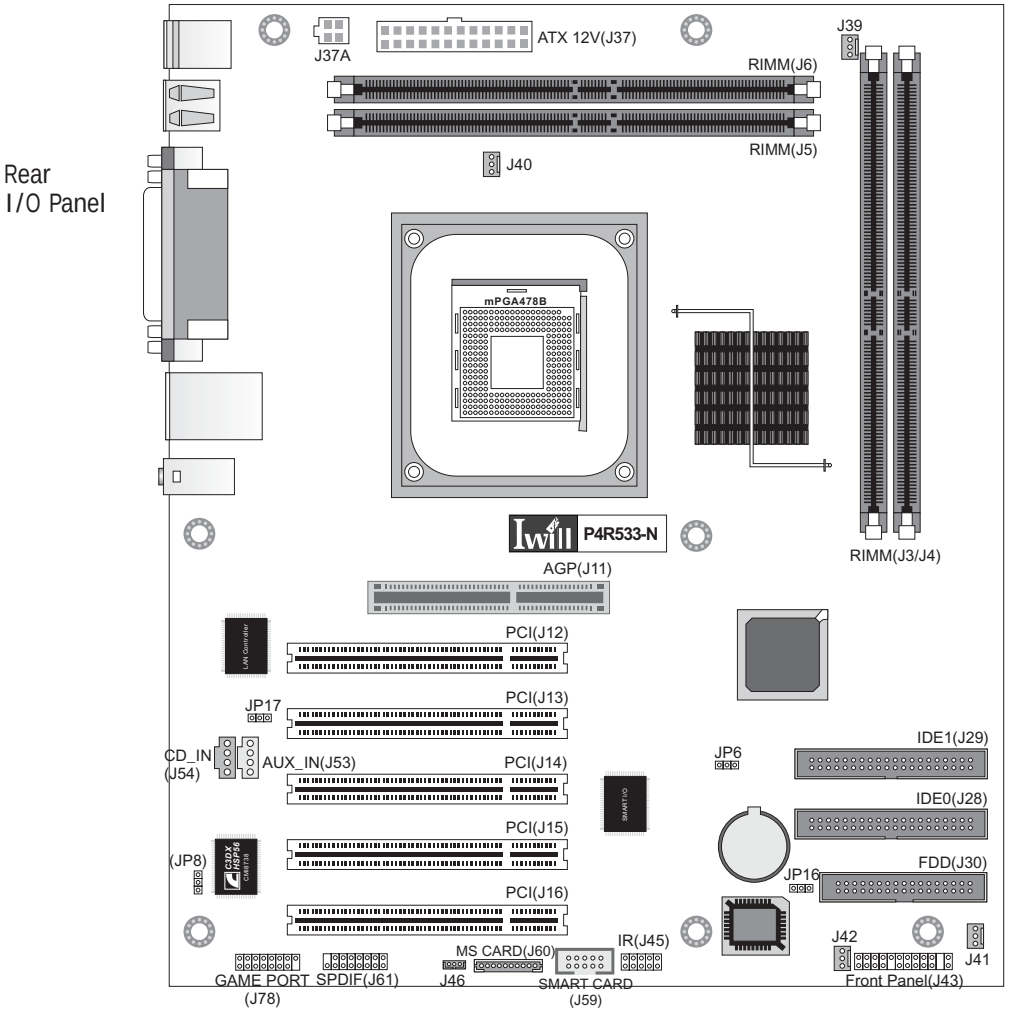
Software Features
- Driver Software
- Utility Software

2: Key Features & Components

This chapter explains the location and function of this motherboard's key features and components. In addition, it details the software that comes on the Power Installer support CD-ROM disc. Please review this chapter if you are installing the motherboard. It is also useful for reference regarding feature functions after the board is installed in a working system.

Motherboard Layout

The diagram and key on these two pages shows the location of key components on the motherboard.



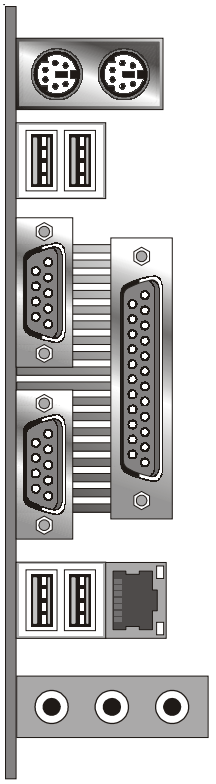
Motherboard Layout Key

Component	Function
CPU	mPGA478 CPU socket
J37, J37A	Power connectors for ATX power supply
J3, J4, J5, J6	RIMM memory sockets for Rambus RIMM modules
J11	AGP connector for 1.5V AGP 4X display card
J12-16	32-bit PCI 2.2 expansion slots
Connectors	
J28, J29	IDE0 & IDE1 ATA drive connectors
J30	Floppy disk drive connector
J40	CPU cooling fan connector
J39, J41, J42	Housing cooling fan connectors
J43	Housing front panel feature connector
J45	IR port module connector
J46	WOL – Wake-On-LAN connector
J53	AUX – auxiliary audio-in connector
J54	CD–In CD-ROM drive audio-in connector
J59	Smart Card Reader connector
J60	Memory Stick Reader connector
J61	Optional 6-channel audio port bracket connector
J78	Game port connector
Jumpers	
JP6	Clear CMOS jumper
JP8	Audio subsystem jumper
JP16	BIOS Flash Protection jumper
JP17	LAN subsystem jumper (P4R533-N only)
Rear panel I/O ports	See figure on next page

Rear I/O Panel Ports:
This figure show the ports on the rear I/O panel. The ports include, from top to bottom:
PS/2 ports
2 USB ports
Parallel & Serial ports
2 USB ports (& LAN port)
Audio ports
The ports have standard color-coding as follows:
PS/2 Keyboard: Purple
PS/2 Mouse: Green
USB Ports: Black
LAN jack: None
Serial Ports: Teal
Parallel Port: Burgundy
Line Out jack: Lime
Line-In jack: Light Blue
Microphone jack: Pink
Game/MIDI: Gold*

Note:
This figure illustrates the P4R533-N ports. The standard P4R533 does not have the onboard LAN feature or jack.

*The Game port connector is on the motherboard and connects to the optional 6CHG 6-channel audio port bracket that mounts in an expansion slot opening. The colored port is on the port bracket.



PS/2 Keyboard, PS/2 Mouse

USB2, USB1

Serial 1 (COM1)

Parallel

Serial 2 (COM2)

USB4, USB3, LAN RJ-45

Line Out, Line In, Mic

Key Features & Components

This section explains the function and use of key features and components on the motherboard. It also indicates where to look in the manual for additional information on configuring and using them.

This motherboard uses an ATX form factor PCB in a design that integrates many features onto the board including several external ports.

Intel 850E Chipset

This motherboard uses the Intel 850E Chipset. It is a multi-function chipset for higher-end performance and mainstream systems. The components of the Intel 850E Chipset include the following devices mounted on the board:

- 82850E Memory Controller Hub (MCH)
- 82801BA I/O Controller Hub (ICH2)

The chipset provides host bus, memory, AGP, and I/O interfaces and supports both 400MHz and 533MHz Frontside Bus speeds.

CPU Socket

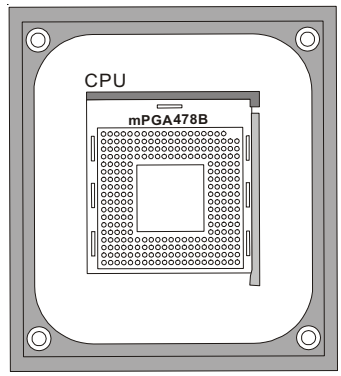
Function: The system CPU installs in this socket.

Description: The mPGA478B CPU socket supports all 478-pin Intel Pentium 4 CPUs that use this socket. The motherboard comes with a mounting frame mounted on the board to attach the heatsink and cooling fan assembly required by the Pentium 4 CPU.

More Information: See the section in Chapter 4 on "Installing CPUs" for information supported CPUs and their installation procedure. Technical specifications are listed in Chapter 7.

⚠ **Note:**
This motherboard supports Pentium 4 CPUs that use a quad-pumped 400MHz or 533MHz Frontside Bus. the CPU settings are automatically detected by the system BIOS.

mPGA478B Socket:
This socket is for 478-pin Pentium 4 CPUs only.



Heatsink/fan assembly mounting frame

⚠ Note:
The default memory specifications are:
400MHz FSB use PC800
533MHz FSB use PC800
If you switch to PC1066 for the 533MHz FSB, you have to manually set the RDRAM Bus Frequency configuration to X4 in the IWILL Smart Setting section of the Award BIOS CMOS Setup Utility.

RIMM Sockets:
System memory sockets for PC800 or PC1066 RIMM modules.
See Chapter 4 for important installation information.

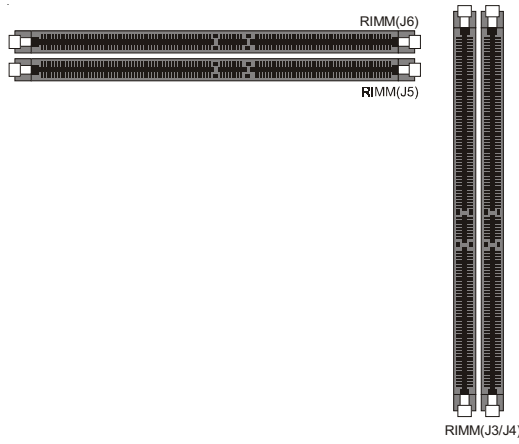
⚠ Note:
The four RIMM sockets must be used in pairs:
J3 & J5
J4 & J6

System Memory Sockets

Function: The RIMM system memory sockets are for installing DRDRAM system memory modules.

Description: There are four RIMM memory module sockets on the motherboard. These sockets are for PC800 or PC1066 ECC DRDRAM memory modules (RIMMs). The sockets function independently, allowing a variety of memory configurations up to a total of 2GB.

More Information: See the section on Installing System Memory in Chapter 4 for configuration specifications and installation instructions. Technical specifications are listed in Chapter 7.



The AGP Slot

Function: The AGP slot is for installing an AGP interface video display card.

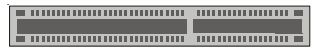
Description: The AGP slot is a high-speed slot exclusively designed for an AGP video display card. The AGP slot supports the following type of AGP card:

- AGP 4X – 266MHz data transfer, maximum 1064MB/ second data throughput

The slot only supports 1.5V devices. Do not use a 3.3V AGP card with this motherboard.

More Information: See the section "Connecting & Installing Internal Peripherals" in Chapter 4. Technical specifications are listed in Chapter 7. Also, see the Advanced Chipset Features section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on setting the AGP memory aperture size.

AGP Slot:
For AGP 4X 1.5V cards only. Do not use 3.3V cards.



AGP slot is for a AGP 4X card

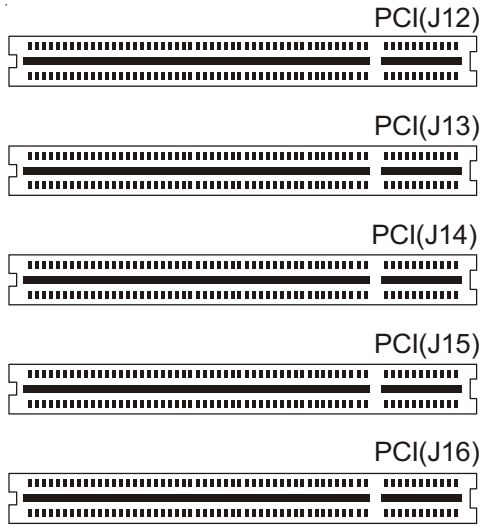
PCI Expansion Slots

Function: The PCI expansion slots are for installing system expansion or "add-on" cards to add additional system hardware.

Description: This motherboard has five Bus Master capable PCI expansion slots. The slots are 32-bit, 33MHz slots and are PCI 2.2-compliant. The slots provide a fast high-bandwidth pathway between the motherboard and expansion cards.

More Information: See the section "Connecting & Installing Internal Peripherals" in Chapter 4. Technical specifications are listed in Chapter 7.

PCI Expansion Slots
All slots are Bus Master capable and PCI 2.2 compliant



Drive Connectors

There are three drive connectors on the motherboard for connecting IDE and floppy disk drives.

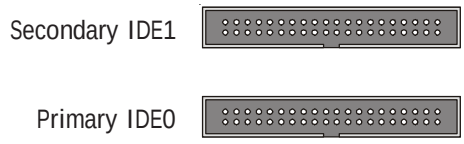
IDE Drive Connectors

Function: The two IDE connectors, marked 'Primary' and 'Secondary', are for connecting IDE drives to the motherboard.

Description: The IDE controller on the motherboard supports IDE devices running in all modes up through ATA-100. There are two IDE drive connectors. Each connector supports two drives, a 'Master' and a 'Slave' which connect to the motherboard with a ribbon cable. The supplied cable supports transfer modes through ATA-100.

More Information: See the section on "Connecting Internal Peripherals" in Chapter 5 for instructions on connecting IDE drives. Technical specifications are listed in Chapter 7.

IDE Drive Connectors
The channels are labeled on the board.



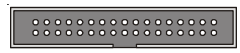
Floppy Disk Drive Connector

Function: The floppy disk drive connector, marked 'Floppy', is for connecting one floppy disk drive to the motherboard.

Description: The floppy disk drive connector supports connecting one floppy disk drive to the motherboard. The 'Floppy' drive connector uses a standard FDD ribbon cable. The floppy disk drive connected to the end of the cable will function as Drive A:. A second drive can be added as Drive B: if required.

More Information: See the section on "Connecting Internal Peripherals" in Chapter 4 for instructions on connecting a floppy disk drive. Technical specifications are listed in Chapter 7.

Floppy Drive Connector



Other Internal Connectors

There are several other connectors on the motherboard.

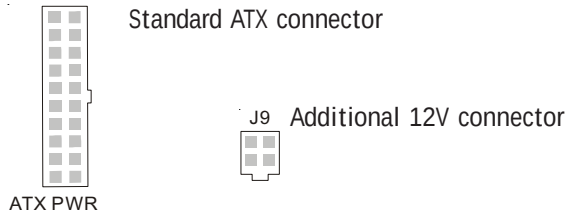
ATX Power Connectors

Function: Connectors for leads from a system ATX power supply.

Description: There are two power connectors on the motherboard for leads from an ATX power supply. The power supply leads plug into the connectors. The connector design prevents incorrect orientation. There are two connectors, the standard 20-pin ATX connector and the additional 4-pin connector that supplies 12-volt current.

More Information: Please refer to Chapter 4, "Installing the Board in a System Housing". Chapter 7 lists technical specifications.

ATX Power Connectors:
An ATX power supply with two power leads is required for this board.



CPU & System Cooling Fan Connectors J39, 40, 41, 42

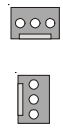
Function: Power connectors for CPU and system housing cooling fans.

Description: There are three system housing cooling fan connectors and one CPU cooling fan connector (J40) on the motherboard. All the connectors are 3-pin headers. The system housing fan connectors support fan tachometer monitoring. The processor heat sink fan is not speed controlled.

The system fans use the motherboard fan speed control, which consists of three states: Off, Normal speed, and High speed. In Normal speed mode, the system fans run at normal speed until the thermal sensor senses the temperature exceeds the High speed fan threshold temperature. The system fans then run at High speed when the temperature threshold is exceeded.

More Information: Please see the PC Health Status section of "Configuring the CMOS Setup Utility" in Chapter 5 for information.

Cooling Fan Connectors: The cooling fan power connectors all use the same 3-pin connector. The System Fan connectors are speed controlled, the CPU Fan connector is not.



Fan power connectors (orientation varies)

WOL: Wake On LAN Connector J46

Function: A connector for the lead from a Network Interface Card that supports the Wake On LAN feature.

Description: This feature enables the system to "wake up" from Suspend mode when it receives a signal over a LAN it is connected to. It works with the optional onboard LAN port and will also work with an additional PCI NIC that supports this feature by connecting the card to the WOL connector on the motherboard.

More Information: Please see the Power Management Setup section of "Configuring the CMOS Setup Utility" in Chapter 5 for information.

Wake On LAN Connector: This connector is for an additional NIC. The optional onboard LAN port supports WOL without using this connector.

Wake On LAN connector

CD-In & AUX Audio Connectors J54 & J53

Function: Connectors for audio-in cables from internal peripherals.

Description: The two audio-in connectors on the motherboard are for audio cables from optical drives such as a CD-ROM or DVD-ROM drive or a modem/telephony device. The connectors provide an audio input connection between a device and the integrated audio subsystem.

More Information: Please see the "Connecting Internal Peripherals" section in Chapter 5.

Audio-In Connectors:
The J54 CD-In connector is for CD-ROM or other optical drives. Use the J53 AUX connector for an additional drive or a modem/telephony device.

J54 CD-In audio-in connector

J53 AUX audio-in connector

IR Connector J45

Function: Connector for an Infrared (IR) port module.

Description: The IR connector supports both IrDA and ASKIR infrared port modules. Follow the module's instructions to install it.

More Information: Please see the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information.

IR Connector J45:
The IR connector is for both IrDA and ASKIR port modules. You must use the Integrated Peripherals section of the CMOS Setup Utility to configure the motherboard to use the IR feature.

IR connector J45

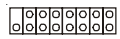
6-Channel Audio Option Connectors J61 & J78

Function: Connector for the optional 6-channel audio port bracket. J78 is a Game port connector for the Game port cable from the 6CHG bracket.

Description: The 6-channel audio connector supports any of the three optional 6-channel audio port brackets, 6CH, 6CHG and SuperAudio. The port bracket provides additional audio connections for a 5.1 speaker system.

More Information: Please see "Connecting Internal Peripherals" section in Chapter 5 and the "System Features" section in Chapter 6.

6-Channel Audio:
This combined connector is for either of the optional audio port brackets which provide additional audio connections for a 5.1 speaker system.
The 6CHG also has a Game port on it with a separate connector cable. The cable plugs onto J78.

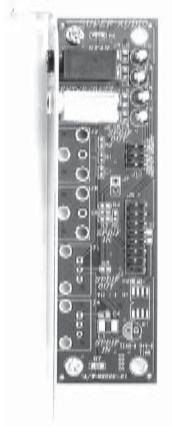


J61 Audio port bracket connector

6CH Audio Port Bracket

Rear Speaker

Center/Bass



SuperAudio Port Bracket

Rear Speaker

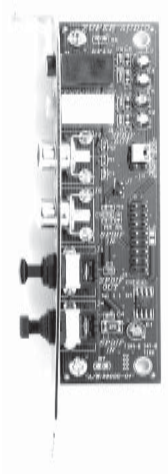
Center/Bass

RCA Out

RCA In

SP/DIF Out

SP/DIF In



6CHG Audio Port Bracket

Rear Speaker

Center/Bass

Game Port

J78 Game port connector

Smartcard Reader Connector J59

Function: Connector for a Smartcard reader module.

Description: A housing mounted Smartcard reader module plugs into to this connector.

More Information: See the "Connecting Internal Peripherals" and "Configuring the CMOS Setup Utility" sections in Chapter 5.

Smartcard Reader:
The connector cable from a Smartcard Reader module plugs into J59.

J59 Smartcard Reader connector

Memory Stick Reader Connector J60

Function: Connector for a Memory Stick™ or Secure Digital™ memory card reader module.

Description: A housing-mounted reader module plugs into to this connector.

More Information: See the "Connecting Internal Peripherals" and "Configuring the CMOS Setup Utility" sections in Chapter 5.

Memory Stick Reader:
The connector cable from a Memory Stick Reader module plugs into J60.

J60 Memory Stick Reader connector

Front Panel Connectors

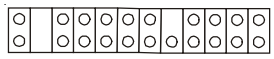
Function: Multifunction pin header connector for system housing front panel features.

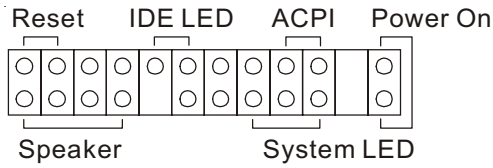
Description: This connector supports the following front panel features:

- Reset Switch
- IDE device activity LED
- System ACPI Suspend switch
- System Power LED
- Housing-mounted speaker

More Information: See Chapter 4 "Installing the Board In A System Housing" and Chapter 6, "System Features".

Front Panel Connector:
Leads from the front panel features connect to this header.


Front Panel feature connector



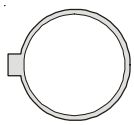
Battery Housing

Function: Housing for system support battery.

Description: An external lithium coin-cell battery powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the standby current from the power supply extends the life of the battery.

More Information: See the Standard CMOS Features section of "Configuring the CMOS Setup Utility" in Chapter 5 to adjust the real-time clock settings.

Battery & Housing:
The battery is a CR2032 Lithium coin cell.


System support battery

External I/O Ports

There are several external Input/Output ports on the rear edge of the motherboard and connectors for more on the board. Please refer to the Rear I/O Panel Ports illustration for the port locations. The ports are color-coded for easy identification.

PS/2 Ports

Function: Connecting PS/2 devices to the system.

Description: The PS/2 ports are for a system keyboard and mouse or other pointing device. Do not connect or disconnect PS/2 devices when the system is turned on.

More Information: See the Advanced Boot Options section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on adjusting related settings.

PS/2 Ports:
Do not plug or unplug devices when the system is turned on.

PS/2 Mouse

PS/2 Keyboard

USB Ports

Function: Connecting USB 1.1 devices to the system.

Description: These four ports are for USB 1.1 devices. The ports are for "Type A" USB cable connectors. You can connect or disconnect USB cables when the system is turned on.

More Information: See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on adjusting port settings.

USB Ports:
There are four USB ports on the rear panel. Ports 3/4 have a separate root hub and have the LAN port mounted in the same housing on the P4R533-N model.

USB ports 1/2

USB ports 3/4 (with P4R533-N LAN)

LAN Port (P4R533-N Only)

Function: Connecting a CAT 5 LAN cable to the system.

Description: This is an RJ-45 connector for standard Cat 5 LAN cabling with RJ-45 jacks. The connector is for the optional onboard LAN controller. You can connect or disconnect a LAN cable when the system is turned on.

More Information: See the System Features section of Chapter 6 for moreinformation on LED modes.

LAN RJ-45 Jack:
Upper LED = Activity
Lower LED = Link

RJ-45 LAN jack
(on top of USB3/4 ports)

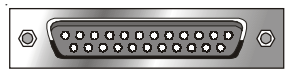
Parallel Port

Function: Connecting a device with a parallel interface to the system.

Description: The parallel port is generally used to connect a printer to the system. The port supports common parallel port modes and allows bidirectional communication. Use an IEEE 1284 compliant cable with the default ECP mode configuration.

More Information: See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on adjusting port settings.

Parallel port:
The default mode is ECP, configured as EPP 1.9, DMA 3. 1284 compliant.



Parallel port

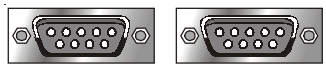
Serial (COM) Ports

Function: Connecting Serial devices.

The two serial ports have 9-pin connectors. They can operate at speeds up to 115,200bps. You can configure the port speed in the computer's Operating System. Do not connect or disconnect a serial cable when the system is turned on.

More Information: See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on adjusting port settings.

Serial Ports:
The default configuration is Serial 1 = COM1 and Serial 2 = COM2. Installing an IR port requires disabling COM2.



Serials ports 1 & 2

Audio Jacks & Connectors

Function: Jacks for connecting external audio devices to the onboard audio subsystem.

Description: There are three audio jacks:

- Line Out

  For the two stereo speakers.
- Line In

  Audio input connector for an external audio source.
- Mic

  Microphone connector for a computer microphone.

More Information: See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on audio settings.

External Audio Jacks:
The onboard audio supports stereo speakers, audio input and a microphone.

Mic (Pink)

Line In (Light Blue)

Line Out (Lime)

Jumpers

There are four jumper switches on this motherboard. Jumpers function like switches to establish a hardware configuration setting.

JP6 Clear CMOS

JP6 Clear CMOS:
Default – Normal

Function: Clears the CMOS Setup Utility configuration record stored in the real-time clock's CMOS memory.

Description: A 3-pin jumper.

More Information: See Chapter 3 for configuration information and the Troubleshooting section in Chapter 6.

JP8 Audio Chip

JP8 Audio Chip:
Default – Enabled

Function: Enables or Disables the onboard audio chip.

Description: A 3-pin jumper.

More Information: See Chapter 3 for configuration information and "System Features" in Chapter 6.

JP16 Flash Protect

JP16 Flash Protect:
Default – BIOS control

Function: Sets protection method to prevent accidental overwriting of installed system BIOS.

Description: A 3-pin jumper.

More Information: See Chapter 3 for configuration information and the "Performance Optimization" section in Chapter 6.

JP17 LAN Chip (P4R533-N only)

JP17 Onboard LAN:
Default:
P4R533-N – Enabled

Function: Enables or Disables the onboard LAN feature.

Description: A 3-pin jumper.

More Information: See Chapter 3 for configuration information and "System Features" in Chapter 6.

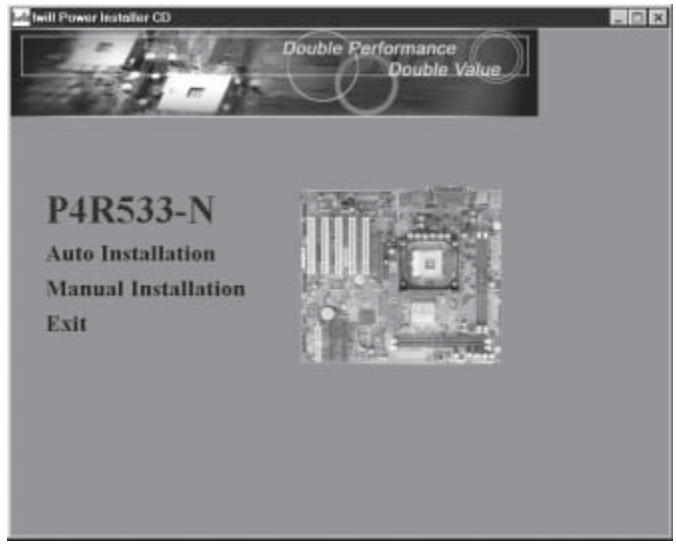
Software Features

This motherboard comes with driver software and bundled utility software on the supplied Power Installer CD-ROM disc. The Installing OS & Support Software section in Chapter 5 explains how to install the software required to support this motherboard and profiles the bundled utilities.

Using the Power Installer Disc

You can run the Power Installer CD-ROM install interface under Microsoft Windows 9X, NT 4.0, 2000 or XP. The disc's install interface should load automatically and you then click on the model name of this motherboard.

Power Installer:
P4R533/P4R533-N
Main installation screen



Driver Software

This motherboard requires that you install driver software to support the onboard hardware. You will need to install the following:

- Intel 850E chipset support software

  Driver that supports the chipset and the Intel Application Accelerator that enhances system performance.
- LAN driver software (for use with P4R533-N only)

  Driver software for the P4R533-N onboard LAN
- Audio driver software

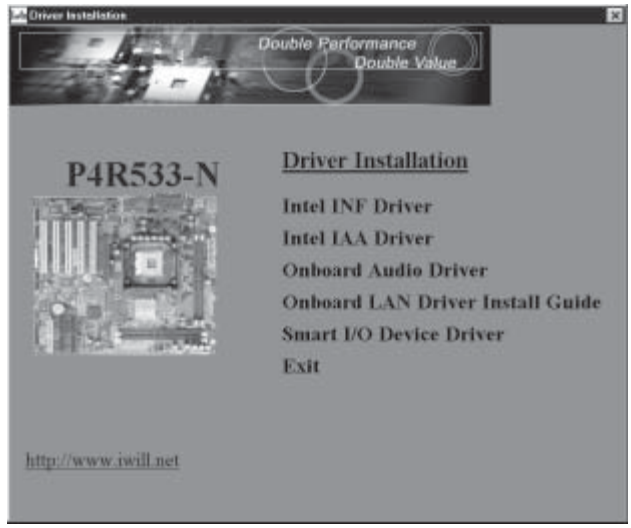
  Audio driver and utilities for the onboard CMedia audio chip.
- Onboard LAN Driver Install Guide

  An Adobe Acrobat file that explains where to look for instructions on installing the appropriate LAN driver for your Operating System.
- Smart I/O Device Driver

  Driver for Smart Card, Memory Stick and Secure Digital Card readers.

Please see "Installing OS & Support Software" in Chapter 5 for more information.

Power Installer:
P4R533/P4R533-N
Driver Installation screen



Utility Software

The Power Installer disc also has several Windows utility programs on it.

- Acrobat Reader

  Acrobat Reader allows you to read documents in the Adobe PDF format, including online documents on the Power Installer disc and a wide range of other content. The reader is free and can be upgraded at the Adobe web site – www.adobe.com – when new versions become available.

- McAfee Anti-Virus

  This is anti-virus software from one of the leading vendors.

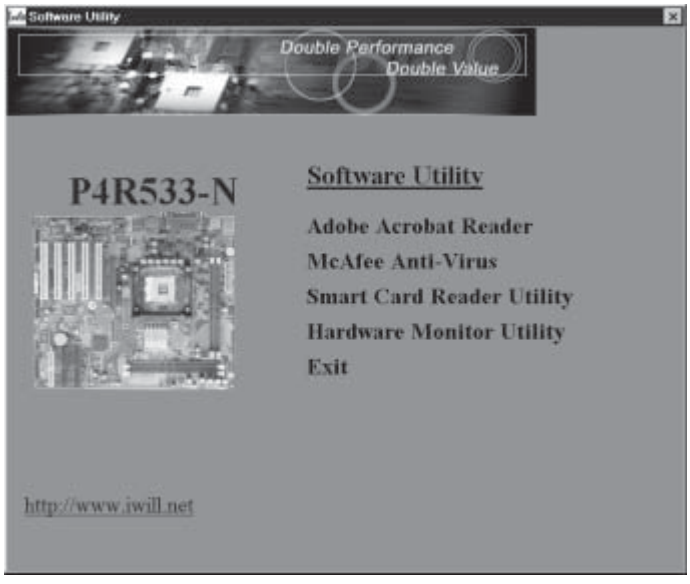
- Smart Card Reader Utility

  Software utility for accessing smart cards inserted in a smart card reader connected to the motherboard.

- Hardware Monitor Utility

  Hardware Doctor is a Winbond utility that allows you monitor the system hardware and obtain information about volatge levels, internal housing and CPU temperatures and CPU and system memory specifications.

Power Installer :
P4R533/P4R533-N
Utility installation screen



In This Chapter:

The Default Configuration
Hardware Configuration: Jumper Settings
Firmware Configuration: The BIOS CMOS Setup Utility
Reconfiguring the Motherboard
Hardware Reconfiguration
Firmware Reconfiguration

3: Motherboard Configuration

This chapter details the motherboard's default configuration and configuration options. Please review the contents of this chapter to find out information on the default configuration or alternative configuration options to change the default configuration.

The motherboard will operate properly in the default configuration. Please make certain that any configuration changes you make will not adversely affect system operation.

The Default Configuration

The default configuration is set at the time of manufacture. The configuration is comprised of the hardware configuration settings and the default firmware settings in the BIOS CMOS Setup Utility.

Hardware Configuration: Jumper Settings

This motherboard is mainly configured in firmware, which simplifies configuration. There are also a few hardware settings. The hardware settings are configured using standard jumper switches. The motherboard has five jumper switches. The first section is about the two BIOS-related jumpers and the second about the three hardware configuration jumpers.

BIOS-Related Jumpers

Jumper JP6: Clear CMOS Memory

JP6 is a jumper switch, but it does not set a hardware configuration setting. The BIOS CMOS Setup Utility creates a system configuration record that is stored in CMOS memory in the real-time clock chip. If the configuration record data becomes corrupted or is destroyed, or if the CMOS Setup Utility settings are changed to an unusable configuration, the motherboard may not run properly or at all. JP6 provides a means to delete the configuration data stored in CMOS memory and reset the configuration to the CMOS Setup Utility's Optimized Defaults.

Follow this procedure to clear CMOS memory. The jumper is beside the coin battery. If necessary, refer to the board diagram and key in Chapter 2 for the location of the JP6 jumper.

1. Turn off and unplug the system. Remove the system housing cover (see documentation if necessary).
2. Set JP6 to the Clear CMOS position by placing the jumper cap over pins 2 and 3 for one minute.
3. Return the jumper cap to the Normal position.
4. Replace the system housing cover, plug in the system and turn it on.
5. Run the CMOS Setup utility and load the Optimized Defaults. You can then enter any custom settings you require.
6. Save the settings as you exit the program and restart the computer.

The system should now operate normally.

JP6: Clear CMOS Memory

Setting	Function
Short 1-2	Normal operation [Default]
Short 2-3	Clear CMOS memory – see instructions

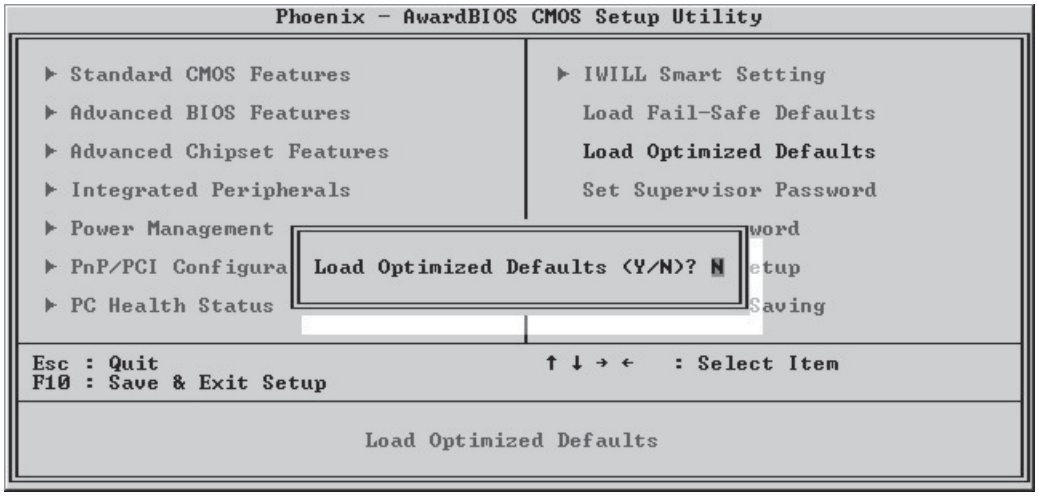
BIOS CMOS Setup Utility – Main Screen

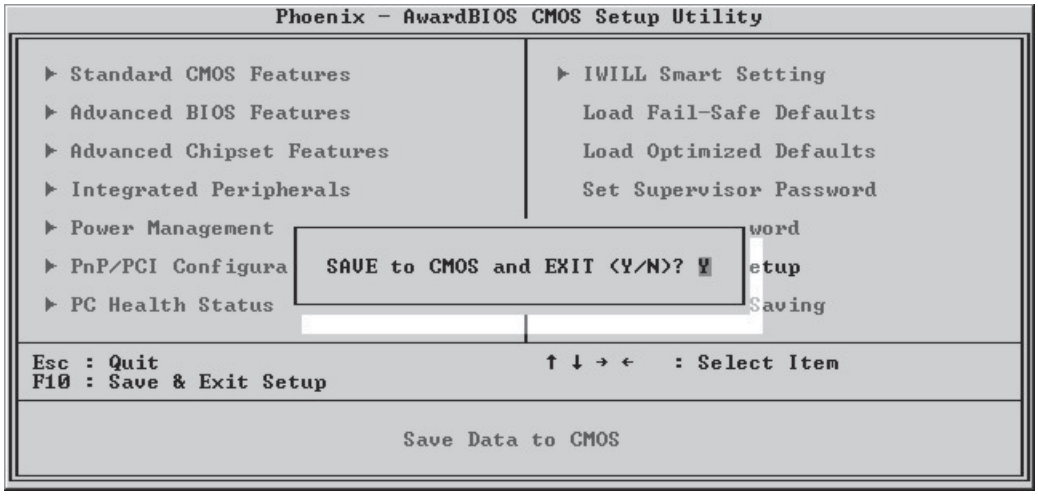
The main screen of the CMOS Setup Utility has a Load Optimized Defaults item that loads the default operation settings. After you perform the Clear CMOS procedure, load the defaults as follows:

1. Select Load Optimized Defaults and press the Enter key.
2. A message will appear asking you to confirm.
3. Type a Y to confirm and press the Enter key again.
4. Make other settings you require.
5. Select Save & Exit Setup and press the Enter key.

The system will restart and use the new settings.

See the section on "Configuring the CMOS Setup Utility in Chapter 5 for information on how to use this program.





Jumper JP16: BIOS Flash Protect

The system BIOS and CMOS Setup Utility are stored in Flash memory on the motherboard, which provides permanent storage, but is rewritable, allowing for BIOS updates. Jumper JP16 controls the protection scheme that prevents accidental damage to or rewriting of the data stored in Flash memory.

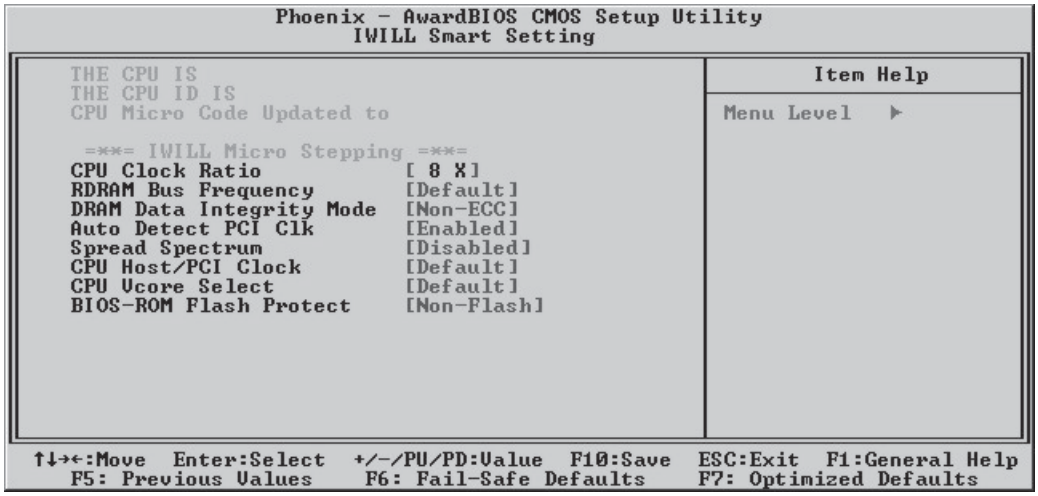
JP16 has three setting options which allow the BIOS to be protected either by a firmware setting in the "IWILL Smart Setting" section of the CMOS Setup Utility or by the jumper's hardware setting. The firmware setting option is more convenient, so it is the default setting for this jumper. The setting options are listed in the table below.

JP16: BIOS Flash Protect

Setting	Function
Short 1-2	Flash protection mode enabled
Short 2-3	Protection mode selected in BIOS CMOS Setup Utility [Default]
Open [Remove Cap]	No BIOS Flash Protection

BIOS CMOS Setup Utility – IWILL Smart Setting

The IWILL Smart Setting section of the CMOS Setup Utility has a BIOS-ROM Flash Protect item that controls BIOS flash protection. The default setting is “Non-Flash”. The optional setting is “Flashable”. See the section on “Configuring the CMOS Setup Utility in Chapter 5 for information on how to use this program.


Phoenix - AwardBIOS CMOS Setup Utility
IWILL Smart Setting
THE CPU IS
THE CPU ID IS
CPU Micro Code Updated to
=**= IWILL Micro Stepping =**=
CPU Clock Ratio [8 X]
RDRAM Bus Frequency [Default]
DRAM Data Integrity Mode [Non-ECC]
Auto Detect PCI Clk [Enabled]
Spread Spectrum [Disabled]
CPU Host/PCI Clock [Default]
CPU Vcore Select [Default]
BIOS-ROM Flash Protect [Non-Flash]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Hardware Configuration Jumpers

Jumper JP8: Audio Chip

This jumper controls the onboard CMedia audio chip. If this is disabled, the onboard audio will not work and its system resources are released for other use.

JP8: Audio Chip

Setting	Function
Short 1-2	Enabled [Default] - Onboard audio chip is enabled
Short 2-3	Disabled - Onboard audio chip is disabled

Jumper JP17: LAN Chip (P4R533-N only)

This jumper controls the onboard LAN feature on the P4R533-N. If this is disabled, the onboard LAN will not work and its system resources are released for other use.

JP17: LAN Chip

Setting	Function
Short 1-2	Enabled [Default]
Short 2-3	Disabled

Note:
Both models can also use PCI Network Interface Cards. This jumper has no effect on them.

Firmware Configuration: The CMOS Setup Utility

The BIOS CMOS Setup Utility a configuration record of system settings. This record is based on the "Optimized Defaults that are stored with the utility in Flash memory and can be reloaded at any time.

Many of these settings are either recommended or required for the motherboard to operate properly. Other settings are customizable and can be changed to suit your specific system configuration and operation requirements.

A number of the variable settings, such as CPU and IDE device settings are set to be automatically detected in the default configuration. While these settings can also be established manually, automatic detection is more convenient, safe and reliable. We strongly recommend that you leave all auto-detection settings undisturbed unless you have a specific reason not to and you are certain of what you are doing. Incorrect configuration of the CMOS Setup Utility can result in unreliable operation or a failure of the motherboard to work at all.

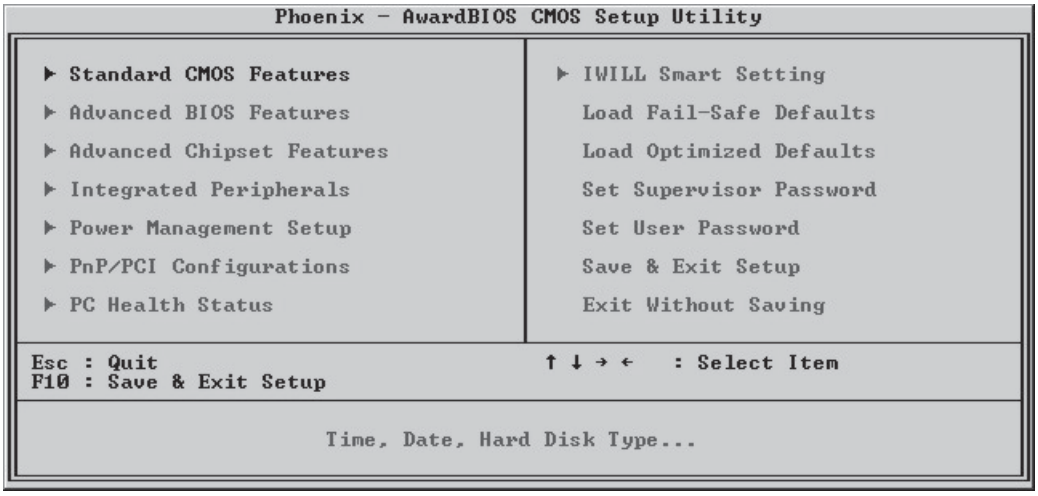
Using the CMOS Setup Utility

Please refer to the "Configuring the CMOS Setup Utility" section in Chapter 5 for information on using the utility and some settings you might want to customize. The utility does not run under an Operating System. You must load it during the Power On Self Test (POST) while the computer is starting up by press the Delete key or the Del key on the system keyboard's numeric keypad.

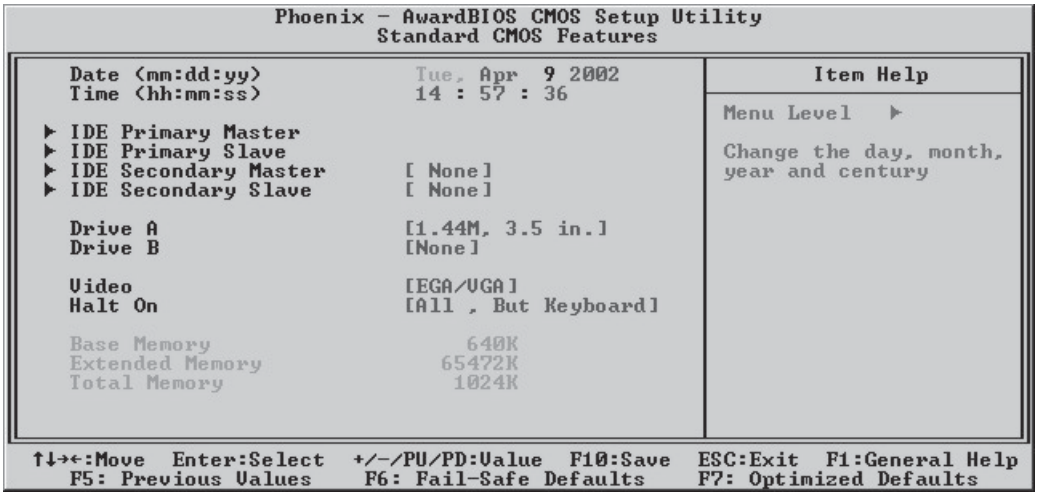
BIOS CMOS Setup Utility – Main Screen

Load the CMOS Setup Utility during the POST by pressing the Delete or Del key. The utility interface commands are explained at the bottom of each screen and "General Help" is available by pressing the F1 key. See the section on "Configuring the CMOS Setup Utility in Chapter 5 for information on how to use this program.

The main screen has a basic list command instructions at the bottom of the screen and displays a function description of the highlighted item.


Phoenix – AwardBIOS CMOS Setup Utility
▶ Standard CMOS Features
▶ Advanced BIOS Features
▶ Advanced Chipset Features
▶ Integrated Peripherals
▶ Power Management Setup
▶ PnP/PCI Configurations
▶ PC Health Status
▶ IWILL Smart Setting
Load Fail-Safe Defaults
Load Optimized Defaults
Set Supervisor Password
Set User Password
Save & Exit Setup
Exit Without Saving
Esc : Quit
F10 : Save & Exit Setup
↑ ↓ → ← : Select Item
Time, Date, Hard Disk Type...

Sections marked by an arrow on the main screen have a list of command instructions at the bottom of each screen.


Phoenix – AwardBIOS CMOS Setup Utility
Standard CMOS Features
Date (mm:dd:yy) Tue, Apr 9 2002
Time (hh:mm:ss) 14 : 57 : 36
▶ IDE Primary Master
▶ IDE Primary Slave
▶ IDE Secondary Master [None]
▶ IDE Secondary Slave [None]
Drive A [1.44M, 3.5 in.]
Drive B [None]
Video [EGA/VGA]
Halt On [All , But Keyboard]
Base Memory 640K
Extended Memory 65472K
Total Memory 1024K
Item Help
Menu Level ▶
Change the day, month, year and century
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Reconfiguring the Motherboard

You can change the default configuration (as shipped) of this motherboard as needed. However, since this motherboard has only a few hard configuration options and the CMOS Setup Utility is configuration is mostly either required, recommended or automatic, there will probably be little reason to do so.

Hardware Reconfiguration

We recommend leaving the jumper settings at the default settings unless you need to perform the Clear CMOS procedure. It is much more convenient to control the BIOS Flash Protection feature using the CMOS Setup Utility.

If you want to use a sound card instead of the onboard audio, you should Disable the onboard audio.

You can also Disable the onboard LAN on the P4D-N if the need arises, though you don't need to do this to add another LAN card to the system.

Firmware Reconfiguration

You can initially specify or customize the CMOS Setup Utility settings when you first configure the system (as covered in Chapter 5) to meet your requirements. Other than doing this, there should be no need to reconfigure the CMOS Setup Utility unless the system configuration changes or the configuration record stored in CMOS memory becomes corrupted and unusable, which is not common. If you need to completely recreate the system configuration record, follow the Clear CMOS procedure described in this chapter.

In This Chapter:

Pre-Installation Preparation
Installing CPUs
Installing System Memory
Installing the Motherboard in a System Housing
Motherboard Installation Procedure
Completing System Configuration

4: Installing the Motherboard

This chapter covers preparing the motherboard for installation, installing the board in a system housing or "chassis" and installing or connecting other internal system components.

There are a number of important topics in this chapter and we strongly urge that you review it before attempting to install the motherboard.

Pre-installation Preparation

Before you install the motherboard you will need to do the following:

- Install a 478-pin Intel Pentium 4 CPU
- Install Rambus RIMM system memory modules

Both of these require specific procedures that you must follow precisely to insure that the components are successfully installed and work properly. Please review the instructions in this section in detail and follow them carefully. The procedures are not complex.

Installing A CPU

This motherboard uses the 478-pin Intel Pentium 4 processor. To install an Intel Pentium 4 CPU on the motherboard it is very important to precisely and entirely follow the procedure for installing both the CPU and its cooling assembly. Failure to do so can result in either improper operation or damage to the CPU and possibly the motherboard.

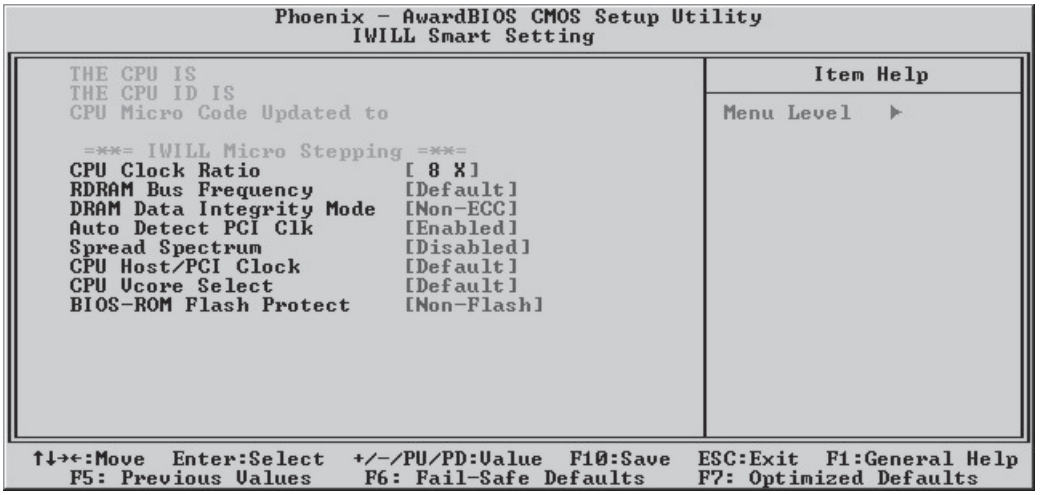
To install an Intel Pentium 4 processor on this motherboard you will need to do the following:

- Install a Pentium 4 processor in the mPGA478 socket
- Install the Heatsink/Retention Mechanism

Please follow the procedure detailed below to install the Pentium 4 processor on the board. Intel boxed Pentium 4 processors come with full installation instructions. If you have these, please also read and follow those instructions carefully.

Processor Selection

This motherboard supports all 478-pin Pentium 4 processors and the BIOS automatically detects the required settings and configures the CMOS Setup Utility accordingly. The settings in the IWILL Smart Setting section control this feature.


Phoenix - AwardBIOS CMOS Setup Utility
IWILL Smart Setting
THE CPU IS
THE CPU ID IS
CPU Micro Code Updated to
=**= IWILL Micro Stepping =**=
CPU Clock Ratio [8 X]
RDRAM Bus Frequency [Default]
DRAM Data Integrity Mode [Non-ECC]
Auto Detect PCI Clk [Enabled]
Spread Spectrum [Disabled]
CPU Host/PCI Clock [Default]
CPU Vcore Select [Default]
BIOS-ROM Flash Protect [Non-Flash]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Installing The Processor

Installing a Pentium 4 processor in the mPGA478 Socket is the simplest part of the procedure. It is very important, however, to carefully handle the processor by the side edges and always fully observe precautions against electrostatic discharge. We assume here that you are installing an Intel Pentium 4 boxed processor that comes with a heatsink and Thermal Interface Material applicator. The illustrations show these. If you are installing a non-boxed processor, the procedure is the same, but the accessory items may have a different appearance.

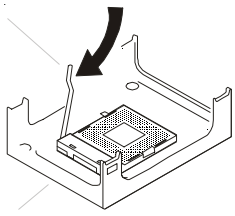
Please follow the installation procedure as illustrated on the next two pages. The illustrations are generic and do not specifically represent this motherboard.

Note:
All Pentium 4 CPUs install the same way. The Front-side Bus speed and other CPU specifications are auto-detected by the BIOS but can also be manually configured in the IWILL Sart Setting section of the CMOS Setup Utility.

The processor installation procedure is as follows:

1. Raise the locking lever of the processor locking mechanism to a perpendicular position.

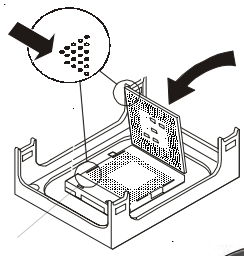
Step 1:
Raise the retaining lever



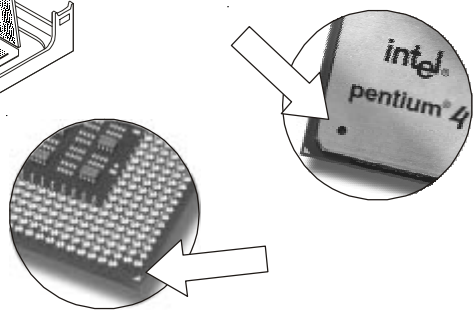
Raise the socket lever to the vertical position

2. Align the processor to the socket by matching the Pin 1 corner of the socket to the Pin 1 corner on the socket, which is located at the corner where the locking arm attaches to the socket.

Step 2:
Align the Pin 1 corners

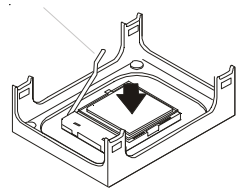


Match the Pin 1 positions on the socket and the processor



3. Carefully insert the Pentium 4 processor in the socket receptacles, taking care not to bend any pins.

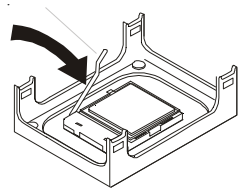
Step 3:
Insert the processor



Gently press the processor into the socket.

4. Lower the locking mechanism's retaining lever and secure it in place to secure the processor in the socket. Grasp the processor by the edges and gently pull upwards to insure it is properly inserted. The processor shouldn't move.

Step 4:
Secure the retaining lever



Press the retaining lever back down into the horizontal position and make sure it latches in place.

Installing the Heatsink

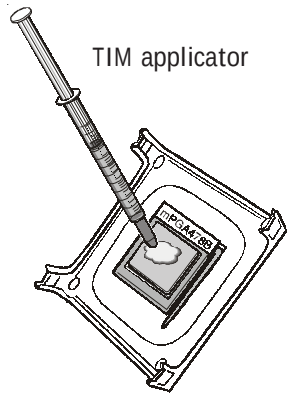
Once you have installed the CPU, you must install a Fan/Heatsink. The Fan/Heatsink clips into to the Retention Mechanism attached to the board via its integrated retaining clip assembly.

Apply Thermal Interface Material

Before you install the Fan/Heatsink you must apply the Thermal Interface Material (TIM) that is supplied in an applicator with boxed Intel Pentium 4 processors (or an exact equivalent) to the top of the installed CPU. If the Fan/Heatsink already has a patch of TIM on its underside, you don't need to apply any additional TIM to the CPU. We assume here that you have TIM in an Intel-supplied applicator. To apply TIM to the CPU do as follows:

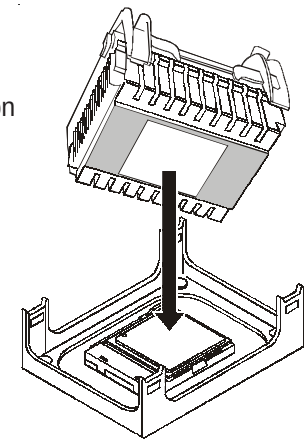
1. Apply all of the TIM in the applicator to the center of the CPU's top plate.

Step 1:
Apply TIM if needed.



2. Do not spread the TIM around. When you place the Heatsink on top of the CPU the material will disperse evenly.

Align and place on top of the CPU



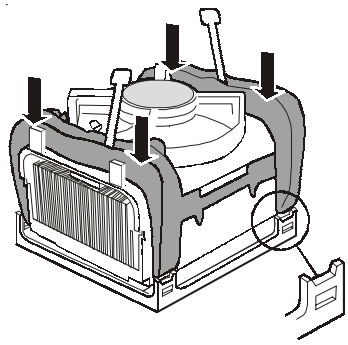
Next, install the processor Fan/Heatsink assembly as detailed below.

Install the Fan/Heatsink

To install the processor Fan/Heatsink assembly do as follows:

1. Place the Fan/Heatsink on top of the Pentium 4 CPU so that it's retaining clip frame snaps into the recesses in the Retaining Mechanism. The Fan/Heatsink will only fit into the mechanism frame in the correct orientation.

Step 1:
Clip Fan/Heatsink assembly into the Retention Mechanism



2. Hold the Fan/Heatsink steady and press one of the clip assembly's locking levers down into the locked position.

Step 2:
Hold the assembly steady and press one of the retaining clip locking arms into the locked position